

CLAIMS

What is claimed as being new and desired to be protected by LETTERS PATENT of the United States is as follows:

1. An  $m$ -ary variable shift keying communications system to allow a user to send and receive electronic signals without interference or fear of interception and interpretation, comprising, in combination:

a signal transmitter, the transmitter configured for sending a signal having a first pulse, the signal being implemented in analog hardware, the signal having a strength and a quieting effect, the transmitter capable of sending a discrete frequency carrier pulse over any portion of a broad bandwidth that contains the signal, the transmitter using a frequency hopping architecture, the signal conveying symbol information, with each symbol having at least one hop time per symbol;

a pseudorandom noise (PN) code integrated into the transmitted signal, the frequency of the carrier pulse being determined by a combination of the transmitted symbol information and the PN code value, the frequency of the carrier pulse being at a non-repetitive, variable offset from a previously transmitted pulse, the previously transmitted pulse being transmitted after the first pulse, the carrier pulse being at a variable offset from any other symbol pulse for a given hop time;

a code for the system in which there are " $m$ " number of

possible frequencies for any given hop time and symbol, each frequency representing the value of the symbol in conjunction with the PN code value for the specific hop time, the number of bits per symbol being represented by logarithm of the base two of  $(m)$ ;

a signal receiver having a plurality of channels implemented in analog hardware, with the signal receiver being tuned during any given hop time to each of the " $m$ " number of channels;

a detection means for each of the " $m$ " channels of the receiver wherein both the strength of the received carrier signal and the quieting effect of said carrier signal are detected and evaluated for maximum interference rejection;

a symbol decision means operatively coupled to the receiver, the symbol decision means comparing the strength and the quieting from each of the " $m$ " channels; and,

an error detection and correction means enabling the receiver to select information from the detections means, the error detection and correction means providing error correction of the received data.

2. An  $m$ -ary variable shift keying communications system to allow a user to send and receive electronic signals without interference or fear of interception and interpretation, comprising, in combination:

a signal transmitter, the transmitter configured for sending

a signal, the signal having a first pulse, the signal being implemented in digital hardware, the signal having a strength and a quieting effect, the transmitter capable of sending a discrete frequency carrier pulse over any portion of a broad bandwidth that contains the signal, the transmitter using a frequency hopping architecture, the signal conveying symbol information, with each symbol having at least one hop time per symbol;

a pseudorandom noise (PN) code integrated into the transmitted signal, the frequency of the carrier pulse being determined by a combination of the transmitted symbol information and the PN code value, the frequency of the carrier pulse being at a non-repetitive, variable offset from a previously transmitted pulse, the previously transmitted pulse being transmitted after the first pulse, the carrier pulse being at a variable offset from any other symbol pulse for a given hop time;

a code for the system in which there are "m" number of possible frequencies for any given hop time and symbol, each frequency representing the value of the symbol in conjunction with the PN code value for the specific hop time, the number of bits per symbol being represented by logarithm of the base two of (m);

a signal receiver having a plurality of channels implemented in digital hardware, with the signal receiver being tuned during any given hop time to each of the "m" number of channels;

a detection means for each of the "m" channels of the receiver wherein both the strength of the received carrier signal and the quieting effect of said carrier signal are detected and evaluated for maximum interference rejection;

a symbol decision means operatively coupled to the receiver, the symbol decision means comparing the strength and the quieting from each of the "m" channels; and,

an error detection and correction means enabling the receiver to select information from the detections means, the error detection and correction means providing error correction of the received data.

3. An m-ary variable shift keying communications system comprising, in combination:

a signal transmitter, the transmitter configured for sending a signal over any portion of a broad bandwidth using a frequency hopping architecture, the signal conveying symbol information, with each symbol having at least one hop time per symbol;

a pseudorandom noise (PN) code integrated into the transmitted signal, the frequency of the carrier pulse being determined by a combination of the transmitted symbol information and the PN code value;

a code for the system in which there are "m" number of possible frequencies for any given hop time and symbol;

a signal receiver having a plurality of channels, with the signal receiver to each of the "m" number of channels;

a detection means for each of the "m" channels of the receiver wherein both the strength of the received carrier signal and the quieting effect of said carrier signal are detected and evaluated;

a symbol decision means operatively coupled to the receiver, the symbol decision means comparing the strength and the quieting from each of the "m" channels; and,

an error detection and correction means providing error correction of the received data.

4. An m-ary variable shift keying communications system as described in Claim 3 wherein the system further comprises the frequency of the carrier pulse being at a non-repetitive, variable offset from a previous pulse, the carrier pulse being at a variable offset from any other symbol pulse for a given hop time.

5. An m-ary variable shift keying communications system as described in Claim 3 wherein the system further comprises each frequency representing the value of the symbol in conjunction with the PN code value for the specific hop time, the number of bits per symbol being represented by logarithm of the base two of (m);

6. An m-ary variable shift keying communications system, as described in Claim 1, wherein the system further comprises timed chirps in place of individual carrier pulses, along with a means for determining distance between a plurality of transmitters and receivers.

7. An m-ary variable shift keying communications system, as described in Claim 2, wherein the system further comprises timed chirps in place of individual carrier pulses, along with a means for determining distance between a plurality of transmitters and receivers.

8. An m-ary variable shift keying communications system, as described in Claim 1, wherein the signal transmitter is configured to shift the relative phase of each carrier pulse, with the receiver having a detection means to decode data encoded by those phase shifts.

9. An m-ary variable shift keying communications system, as described in Claim 2, wherein the signal transmitter is configured to shift the relative phase of each carrier pulse, with the receiver having a detection means to decode data encoded by those phase shifts.

10. An m-ary variable shift keying communications system, as described in Claim 1, wherein the transmitter is configured to modify the parameters of the signal, the parameters being at least one of the class of parameters including amplitude and

phase and frequency, with the receiver also having detection means.

11. An  $m$ -ary variable shift keying communications system, as described in Claim 2, wherein the transmitter is configured to modify the parameters of the signal, the parameters being at least one of the class of parameters including amplitude and phase and frequency, with the receiver also having detection means.